In the Claims:

Claim 1 (amended). A piezoelectric bending transducer, comprising:

a supporting element having opposite sides;

a piezoelectrically active layer applied to at least one of said sides of said supporting element; and

an adaptation layer having a constant thickness, one of a given length and a given width, and a predefined volume for reducing inherent thermal distortion, said adaptation layer applied to said piezoelectrically active layer.

Claim 2 (amended). The piezoelectric bending transducer according to claim 1, wherein said piezoelectrically active layer is applied to both of said sides of said supporting element, and said adaptation layer is applied to said piezoelectrically active layer on one of said sides of said supporting element.

Remarks:

Applicants (hereinafter, Applicant) hereby request reconsideration of the application.

Applicant acknowledges the Examiner's confirmation of receipt of the claim for priority and certified copy of the priority application under 35 U.S.C. § 119(a)-(d).

Claims 1-10 are now in the application. Claims 1-2 have been amended. No new matter is believed to have been added.

In the first paragraph on page 2 of the above-identified Office action, claims 2-5 have been rejected as being indefinite under 35 U.S.C. § 112, second paragraph.

More specifically, the Examiner stated that a phrase (in claim 2) is unclear. This phrase has been clarified as --said adaptation layer is applied to said piezoelectrically active layer on one of said sides of said supporting element--.

It is accordingly believed that the specification and the claims meet the requirements of 35 U.S.C. § 112, second paragraph. The above-noted changes to the claims are provided solely for cosmetic and/or clarificatory reasons. The above-remarks are provided solely for the purpose of explaining the

present invention. They are neither provided for overcoming the prior art nor do they narrow the scope of the claim for any reason related to the statutory requirements for a patent.

In the last paragraph on page 2 of the Office action, claims 1-10 have been rejected as being obvious over Matsumura (JP 3-64081) in view of Nishigaki et al. (U.S. Pat. No. 4,363,993) (hereinafter, "Nishigaki") under 35 U.S.C. § 103.

The rejections have been noted and the claims have been amended in an effort to even more clearly define the invention of the instant application. Support for the changes is found on page 8, lines 1 to 4 of the specification of the instant application.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claim 1 calls for, inter alia, a piezoelectric bending transducer, comprising:

a piezoelectrically active layer applied to at least one of said sides of said supporting element; and

an adaptation layer having a constant thickness, one of a given length and a given width, and a predefined volume for

reducing inherent thermal distortion, said adaptation layer applied to said piezoelectrically active layer.

Accordingly, the *present invention* is directed to a piezoelectric bending transducer having a supporting element and a piezoelectrically active layer applied to at least one side of the supporting element. An adaptation layer with a predefined volume is applied to the piezoelectrically active layer to reduce the inherent thermal distortion. Further, a desired compensation of the inherent distortion is obtained by setting the length and/or the width of the adaptation layer, while keeping the thickness of the adaptation layer constant.

The desired compensation of the thermal inherent distortion of the piezoelectric bending transducer is achieved through a volume adaptation of the adaptation layer. Only geometric parameters of the adaptation layer (for example, the length and/or width and the thickness of the layer) are adjusted in a defined manner to obtain a desired compensation. It is not critical as to what material the adaptation layer is formed of. The compensation of the inherent distortion may be obtained either with an adaptation layer having a low thermal expansion coefficient or with an adaptation layer having a high thermal expansion coefficient. See page 5, lines 24 to 25 and page 6, lines 6 to 11 of the specification of the instant application.

In contrast, the *Matsumura* reference does not teach such an adaptation layer, wherein the volume adaptation occurs by the pre-adjustment of entirely geometrical variables of the adaptation layer. Matsumura discloses a ceramic insulation element (4) with a small surface, which is applied onto a piezoelectric ceramic plate.

Accordingly, Matsumura teaches a material adaptation between the insulation element and the piezoelectric ceramic plate (with regard to the small difference between the thermal expansion coefficients). On the contrary, in the *present invention*, selecting a specific material for the adaptation layer is not necessary. This is so because achieving the desired compensation of the *present invention* is based on a different principle, namely, only geometric variables of the adaptation layer are specifically adjusted (with regard to a volume adaptation).

Since Matsumura is based on a compensation principle, which is different from the *present invention*, Matsumura does not teach or suggest the *present invention*. The ceramic insulation element (4) of Matsumura has a very small base surface compared to the piezo-ceramic plate (3). Thus, Matsumura cannot arrive at the compensation of the *present invention*. Matsumura does not teach or suggest varying the geometry of

the surface of the ceramic insulation element (4) and adjusting the same specifically to obtain a compensation.

The **Nishigaki** reference discloses an electro-mechanical transducer having a first layer having opposing major surfaces (made of piezoelectric material), a pair of electrodes formed on the major surfaces of the first layer, and a second layer clamped at its one surface to one of the surfaces of the first layer.

The first layer has a Young's modulus of E, the second layer has a Young's modulus Ex in one direction and a Young's modulus Ey in the direction perpendicular to the one direction in the major surface. The Young's moduli E, Ex and Ey satisfy the rules E>Ey and Ex>Ey.

One end of the first and second layers along the one direction is clamped. The thickness of the electrode is selected between 0.1 and 3 μm to obtain a large amount of displacement at the other end. The outer surface of the electrode may be coated with a conductive paste *to ensure voltage supply* to the whole surface of the electrode.

Accordingly, the piezoelectric bending transducer of Nishigaki does not contain any measures for compensating the thermal inherent *distortion*.

Clearly, the references do not show "a piezoelectrically active layer applied to at least one of said sides of said supporting element; and *an adaptation layer having a constant thickness, one of a given length and a given width, and a predefined volume for reducing inherent thermal distortion, said adaptation layer applied to said piezoelectrically active layer*", as recited in claim 1 of the instant application (emphasis added). Thus, neither can the specific combination of the aforementioned limitations be shown.

Applicant believes that there is no teaching or suggestion in *the references* to incorporate the features of *one another*.

In other words, the features including the limitations "a piezoelectrically active layer applied to at least one of said sides of said supporting element; *and an adaptation layer having a constant thickness, one of a given length and a given width, and a predefined volume for reducing inherent thermal distortion, said adaptation layer applied to said piezoelectrically active layer*", as recited in claim 1, attain the present invention's objectives and are <u>not taught or suggested</u> by the references, whether taken alone or in any combination (emphasis added).

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art and since all of the dependent claims are ultimately dependent on claim 1, they are believed to be patentable as well.

In view of the foregoing, reconsideration and allowance of claims 1-10 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, the Examiner is respectfully requested to telephone counsel so that, if possible, patentable language can be worked out.

Please charge any fees which might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and

Greenberg, P.A., No. 12-1099.

Respectfully submitted,

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